CLAIMS

We claim:

1. Apparatus for sealing and restraining the flexible pressure boundary of an inflatable spacecraft comprising:

   a. a gas membrane;

   b. a restraint layer;

   c. a retaining member;

   d. a plurality of loops, one end of said loops extending around said retaining member, the other end of said loops connected to said restraint layer;

   e. a base flange having a first face and a second face, said base flange further having an outer surface around the circumference of the base flange;

   f. a locking flange having a mating face, said locking flange further having an outer surface around the circumference of the locking flange, said locking flange connected to said base flange, the first face of said base flange and the mating face of said locking flange contacting to form a plurality of recesses, said recesses extending from around the retaining member to the outer surface of said base flange and said locking flange to form an opening between said locking flange and said base flange, said base flange and said locking flange further forming a plurality of passages, each said passage disposed between and in communication with an adjacent pair of said recesses, said passages for capturing said retaining member, said recesses to accommodate said loops to allow said loops to extend around said retaining member; and

g. a seal flange, said seal flange having a mating face, said seal flange connected to said base flange, the mating face of said seal flange and the second face of said base flange in facing relationship, said gas membrane captured between the mating face of said seal flange and the second face of said base flange.

2. The apparatus as described in claim 1 further comprising a seal, said seal protruding from the mating face of said seal flange to capture said gas membrane between said seal and the second face of said base flange.

3. The apparatus as described in claim 1 further comprising a seal, said seal protruding from the second face of said base flange to capture said gas membrane between said seal and the mating face of said seal flange.

4. The apparatus as described in claim 1 further comprising:

a. a first seal, said first seal protruding from the mating face of said seal flange; and

b. a second seal, said second seal protruding from the second face of said base flange, said first seal and said second seal in facing relationship to allow said gas membrane to be compressed between said first seal and said second seal.

5. The apparatus as described in claim 4 further comprising a dam, said dam connected around the circumference of the base flange between the gas membrane and the restraint layer.

6. The apparatus as described in claim 5 further comprising a carrier layer, said carrier layer disposed between said restraint layer and said gas membrane, said carrier layer to provide a substantially uninterrupted surface against which said gas membrane is urged.

7. The apparatus as described in claim 6 wherein said carrier layer is attached to said restraint layer.

8. The apparatus as described in claim 6 further comprising:
   a. a deadman, said deadman attached to said gas membrane; and
   b. a cavity, said cavity formed from the contacting of the mating face of said seal flange with the second face of said base flange, said deadman disposed in said cavity.

9. The apparatus as described in claim 1 further comprising a rigid member, said rigid member having a hole therethrough, said base flange connected to the exterior of said rigid member.

10. The apparatus as described in claim 4 further comprising a rigid member, said rigid member having a hole therethrough, said base flange connected to the exterior of said rigid member.

11. Apparatus for sealing and restraining the flexible pressure boundary of an inflatable spacecraft comprising:

a. a gas membrane;

b. a restraint layer, said restraint layer extending to form a plurality of loops at the distal ends of said restraint layer;

c. a retaining member;

d. a base flange having a first face and a second face, said base flange further having an outer surface around the circumference of the base flange;

e. a locking flange having a mating face and an outer surface around the circumference of the locking flange, said locking flange connected to said base flange, the first face of said base flange and the mating face of said locking flange contacting to form a plurality of recesses, said recesses extending from around the retaining member to the outer surface of said base flange and said locking flange to form an opening between said locking flange and said base flange, said base flange and said locking flange further forming a plurality of passages, each said passage disposed between and in communication with an adjacent pair of said recesses, said passages for capturing said retaining member, said recesses to accommodate said loops to allow said loops to extend around said retaining member; and

f. a seal flange, said seal flange having a mating face, said seal flange connected to said base flange, the mating face of said seal flange and the second face of said base flange in facing relationship, said gas membrane captured between the mating face of said seal flange and the second face of said base flange.

12. The apparatus as described in claim 11 further comprising a seal, said seal protruding from the mating face of said seal flange to capture said gas membrane between said seal and the second face of said base flange.

13. The apparatus as described in claim 11 further comprising a seal, said seal protruding from the second face of said base flange to capture said gas membrane between said seal and the mating face of said seal flange.

14. The apparatus as described in claim 11 further comprising:

a. a first seal, said first seal protruding from the mating face of said seal flange; and

b. a second seal, said second seal protruding from the second face of said base flange, said first seal and said second seal in facing relationship to allow said gas membrane to be compressed between said first seal and said second seal.

15. The apparatus as described in claim 14 further comprising a dam, said dam connected around the circumference of the base flange between the gas membrane and the restraint layer.

16. The apparatus as described in claim 15 further comprising a carrier layer, said carrier layer disposed between said restraint layer and said gas membrane, said carrier layer to provide a substantially uninterrupted surface against which said gas membrane is urged.

17. The apparatus as described in claim 16 wherein said carrier layer is attached to said restraint layer.

18. The apparatus as described in claim 16 further comprising:

a. a deadman, said deadman attached to said gas membrane; and

b. a cavity, said cavity formed from the contacting of the face of said seal flange with the second face of said base flange, said deadman disposed in said cavity.

19. The apparatus as described in claim 11 further comprising a rigid member, said rigid member having a hole therethrough, said base flange connected to the exterior of said rigid member.

20. The apparatus as described in claim 14 further comprising a rigid member, said rigid member having a hole therethrough, said base flange connected to the exterior of said rigid member.